MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for April, 1896, is based on 2,726 reports from stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 33 from U. S. Army post surgeons; 2,404 from voluntary observers; 32 from Canadian stations; 1 from Hawaii; 96 received through the Southern Pacific Railway Company; 11 from U. S. Life-Saving stations. International simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada, Mr. Curtis J. Lyons, Meteorologist to the Government Survey, Honolulu, and of Dr. Mariano Bárcena, Director of the Central Meteorological Observatory of Mexico.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

East of the Rocky Mountain Plateau regions the mean temperatures during April were generally above the normal; very many stations report the highest maximum temperatures on record.

A region of heavy rainfall covered the upper Mississippi and lower Missouri valleys. The rainfall was below the normal in the Atlantic and Gulf States and in the Ohio Valley.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart IV. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were high in the Middle and South Atlantic States, Florida, and the Ohio Valley. The highest were: Charleston, 30.22; Savannah, 30.21; Jacksonville, 30.20; Mobile, 30.19.

The *mean pressures* were low in the Missouri Valley, the northern and middle slopes, the southern Plateau, and British Columbia. The lowest were: Dodge City, 29.83; Spences Bridge, 29.84; Calgary and Pueblo, 29.85; Concordia, 29.86; Medicine Hat, 29.87; Omaha and Wichita, 29.88.

As compared with the normal for April, the mean pressure was in excess over New England, the Middle and South Atlantic States, the Lake Region, and Quebec and Ontario, but generally deficient west of the Mississippi River. The greatest excesses were: Boston, Wilmington, and Charleston, 0.19; Father Point, Eastport, Block Island, New Haven, Kittyhawk, Hatteras, and Savannah, 0.18; Washington, 0.17. The greatest deficits were: Concordia, 0.17; Rapid City, 0.12; Pueblo, 0.11; Pierre, 0.10.

As compared with the preceding month of March the pressures reduced to sea level show a decided rise over New England, the Middle and South Atlantic States and Lake Region and a decided fall west of the Mississippi River. The greatest rises were: Chatham, 0.25; Father Point and Eastport, 0.24; Charlottetown and Yarmouth, 0.23; Portland, Me., 0.22. The greatest falls were: Concordia, 0.24; North Platte and Dodge City, 0.23; Pierre, 0.22; Huron, 0.21; Omaha and Pueblo, 0.20.

AREAS OF HIGH AND LOW PRESSURE.

By Prof. H. A. HAZEN.

During the month of April nine low areas have been traced on Chart I, and six high areas on Chart II. These charts show also the position of each low and high at each 12-hour period of its existence and the barometer reading at these points. During the last few days of the month an area of rather permanent high pressure remained nearly stationary off the south Atlantic Coast, but not sufficiently near our stations of observation to be charted. A remarkable feature of the lows this month has been their formation on the Pacific Coast in the extreme northwest and their general disappearance before reaching the Atlantic Coast. There has also been a marked absence of storms passing over the Southern States.

The accompanying table exhibits some of the more important facts regarding the origin and velocity of the highs and lows, and the following brief description is added:

HIGH AREAS.

I.—First seen in Wyoming a. m. of 1st; its motion was east-southeast, and was last seen p. m. of 5th off the south Atlantic Coast.

II.—First observed in Washington State p. m. of 3d; its motion was eastward, reaching the Atlantic Coast a. m. of 9th. After that it hovered off the coast and its last definite location was off the south Atlantic Coast p. m. of 11th.

III.—First seen to the north of Montana a. m. of 15th; its motion was to the north of stations of observation, and it disappeared in Manitoba p. m. of 17th.

IV.—First noted to the north of Montana a. m. of 20th; its motion was southeast, and it was last noted off the middle Atlantic Coast p. m. of 23d.

V.—This high was seen first to the north of Lake Superior a. m. of 23d; its motion was the slowest of any high during the month, and this slow motion was partly made up from its hovering near Nova Scotia for three days. It was last noted a. m. of 28th off Nova Scotia.

VI.—Like the last, this high was first seen to the north of Lake Superior a. m. of 28th. It moved east to the north of the St. Lawrence, which it reached p. m. of 30th.

LOW AREAS.

I.—This is the continuation of No. X of March, which was in Iowa p. m. of 31st, and first noted in Wisconsin; its motion was eastward, and it was last seen in the St. Lawrence Valley p. m. of 2d.

II.—First noted p. m. of 1st in eastern Virginia; its motion was northeast, and it disappeared off Nova Scotia p. m. of 5th.

III.—Was first seen off the north Pacific Coast a. m. of 6th; its motion was first southeast, reaching Kansas 7th; thence its track was northeast, being last noted over Lake Huron p. m. of 9th.

IV.—Was first seen off the middle Pacific Coast a. m. of 9th; its motion was a little south of east to Kansas and then northeast. It was last noted north of Lake Superior a. m. of 14th.

V.—First noted to the north of Montana p. m. of 11th; its motion was southeast to Nebraska, thence northeast to the north of Lake Huron, where it was last seen a. m. of 16th.

VI.—This storm was first seen in New Mexico a. m. of 16th; it moved north-northeast, and disappeared in Manitoba p. m. of 19th.

VII.—This storm also originated off the north Pacific coast p. m. of 18th; its motion was nearly due east, and it was last seen off the New England Coast a. m. of 22d. This storm and No. II are the only ones of the month reaching the Atlantic.

VIII.—First noted to the north of Montana p. m. of 20th; its motion was eastward, at the lowest velocity of any storm of the month. It was last seen to the north of Lake Superior p. m. of 24th.

IX.—First seen off the middle Pacific Coast p. m. 23d; its motion was erratic, as it doubled on itself. It was last noted p. m. of 30th in northern Minnesota.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	43	111	5, p. m.	32	79	3,070	4.5	681	29.2
II	3, p. m.	48	118	11, p. m.	32	78	4,180	8.0	522	21.8
III	15, a. m.	54	117	17, p. m.	52	105	980	2.5	396	16.5
IV	20, a. m.	52	111	23, a. m.	34	76	2,370	3.5	677	28.2
V	23, a. m.	50	85	28, a. m.	43	64	1,850	5.0	371	15.5
VI	28, a. m.	48	85	30, p. m.	49	66	970	2.5	389	16.2
Sums							13,430	26.0	3,036	127.4
Mean of 6 paths							2,238	4.33	506	21.2
Mean of 26 days									517	21.5
Low areas.										
I	1, a. m.	46	89	2, p. m.	48	75	680	1.5	456	19.0
II	1, p. m.	37	77	5, p. m.	46	57	1,610	4.0	403	16.8
III	6, a. m.	48	127	9, p. m.	43	84	3,030	3.5	867	36.1
IV	9, a. m.	43	124	14, a. m.	50	87	2,530	5.0	506	21.1
V	11, p. m.	52	116	16, a. m.	47	83	2,260	4.5	503	21.0
VI	16, a. m.	32	109	19, p. m.	51	95	1,870	3.5	535	22.3
VII	18, p. m.	47	124	22, a. m.	41	69	3,300	3.5	915	38.1
VIII	20, p. m.	53	116	24, p. m.	51	86	1,600	4.0	401	16.7
IX	23, p. m.	42	126	30, p. m.	48	97	3,550	7.0	507	21.5
Sums							20,330	36.5	5,093	212.6
Mean of 9 paths							2,259	4.6	566	23.6
Mean of 36.5 days									557	23.2

LOCAL STORMS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

2d.—Severe winds were experienced throughout portions of Wisconsin, Michigan, and northern Indiana. In some cases the wind was accompanied by heavy snow and freezing temperatures. Railway train service was much impeded in northern Wisconsin and Michigan.

10th.—Severe winds visited portions of Wapello and Jefferson counties, Iowa, on the morning of the 10th. The damage was confined to barns and outbuildings.

11–12th.—High winds with rain, snow, or sleet prevailed throughout eastern Colorado and western Kansas from near midnight of the 11th until late in the afternoon of the 12th. The area of storm winds also extended southward to northern-central Texas. Traffic was generally suspended on all railway lines in Colorado and there was also more or less minor damage to telegraph and telephone wires, electric light plants, etc. The damage in Texas was mostly caused by high winds. The points at which small losses occurred were Fort Worth, Cresson, Reagin, Annetta, Abilene, and Colorado City. At the last-named place the storm assumed the violence of a tornado (see March REVIEW, p. 82). A tornado also occurred in the vicinity of Cale, Ind. T.; damage small.

13th.—Severe local winds were felt at Burlington and Clinton, Vt., but no serious damage was done.

15th.—Severe thunderstorms, at times approaching the violence of a tornado, occurred in Faulk and Edmund counties, S. Dak., during the early morning of this date.

19th.—A destructive hailstorm visited the towns of New Marlboro, Sandisfield, and Tolland, Mass., destroying many panes of glass and damaging the interiors of a number of residences at those places.

20th.—A tornado occurred on the afternoon of this date near Fremont, Sandusky County, Ohio, and many destructive thunderstorms were experienced in other portions of northern Ohio, Indiana, and Pennsylvania. The path of greatest severity extended from the Indiana line across the State of Ohio and into the northwestern portion of Pennsylvania. Roofs and chimneys were damaged by the high winds; crops and fences were blown down; cellars flooded and considerable loss was entailed upon electric light companies by the blowing down of their wires and poles. Damages by severe thunderstorms were also reported from various points in Nebraska, Iowa, Illinois, and Indiana.

22d.—Severe wind and hailstorms passed over small portions of Nevada, Vernon, and Stoddard counties, Mo., on this date. The damage was confined to fruit trees and crops.

24th.—Two houses were demolished by a severe windstorm at Salem, Va.

25th.—The most severe storm of the month, measured by the number of lives lost and the value of property destroyed, occurred shortly after 7 o'clock of this date. The storm was first observed near the little town of St. Joseph, in the eastern part of Cloud County, Kans., thence it passed in a northeasterly direction through the northern part of Clay County, and into the southern edge of Washington County. Its path was about 400 feet wide and 20 miles long; 8 people were killed and about 20 injured; loss about $15,000.

26th.—A severe wind and hail storm passed over parts of Conway and Faulkner counties, Ark., blowing down some timber and fences and a few houses.

The following is from the report of the North Dakota Climate and Crop Service, April, 1896:

A severe cyclone [tornado] occurred at 5 o'clock p. m., Sunday, April 26, in the western portion of Barnes County, the most destruction to property occurring near Hobart, and one person was injured at that place. The tornado formed near the foot of Lake Eckelson and moved in a zig-zag course in a northeasterly direction, barns and a schoolhouse in its path being wrecked and all of the buildings belonging to Nels Monson, a farmer, were destroyed. Monson was carried away